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10/623,195	07/18/2003	Ming-Chieh Lee	3382-66125-01	2663

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EXAMINER	
WONG, ALLEN C	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/623,195	Applicant(s) LEE ET AL.	
	Examiner Allen Wong	Art Unit 2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 February 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10,12-18 and 20-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *1-7* is/are allowed.

6)☒ Claim(s) *8-10,12-18 and 20-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *18 July 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date *2/29/08*.

4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 2/29/08 has been entered.

Response to Arguments

1. Applicant's arguments with respect to claims 8-10, 12-18 and 20-23 have been considered but are moot in view of the new ground(s) of rejection.

The 101 rejection is withdrawn based on the amendment to claim 16.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 8, 12-16, 18 and 20-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Altieri (6,104,751) in view of Lee (5,748,789).

Regarding claim 8, Altieri discloses a video decoder comprising:

an inverse quantizer for dequantizing coded macroblocks of a frame in a video sequence encoded in a compressed video bit stream (col.6, ln.56 and fig.3, element 12);

a side information decoder for reading side information encoded apart from compressed video content in the compressed video bit stream according to a syntax scheme, wherein the side information includes information of differential quantization applied to macroblocks of the frame in regions (col.7, ln.1-9, fig.3, element 10, the VLD decoder decodes the headers, via the VLD BUS, of the encoded video data information that contains the quantized information of the image regions applied to macroblock frame data, in that headers must comprise syntactical coding schemes for defining compression parameters to clearly indicate how the content of the video data is encoded); and

a dequantization controller for controlling a quantization strength applied by the inverse quantizer in dequantizing individual macroblocks of the frame in accordance with the decoded side information of differential quantization of the respective macroblocks (col.7, ln.10-27, fig.3, note element 12 is interactively connected by having input data from elements 10, 24 and 28 for controlling a quantization strength applied to the inverse quantizer 12 for decoding and dequantizing macroblock data).

Artieri discloses the boundary areas of images (col.20, ln.42-54; Artieri discloses that boundaries of slices are considered and determined during image encoding/decoding process, wherein slices are part of an image frame). Artieri does not specifically disclose the term “wherein the syntax scheme identifies a differently

quantized region to be from among a list of coding possibilities that comprises a single boundary edge and a pair of adjacent boundary edges of the frame". However, Lee discloses the identifying the differently quantized region to be from among the list of coding possibilities that comprises the single boundary edge and the pair of adjacent boundary edges of the frame (col.28, ln.19-35, Lee discloses that quantization of image data can be applied to each object for indicating different quantized region from many coding possibilities, in col.37, ln.19-35, Lee discloses the determination of shapes and various boundaries that must include many types of boundaries like single edge of an object, or from object with multiple boundaries as seen in fig.30, and col.37, ln.57-63, Lee discloses that each mask, containing boundary or contour information, can be compressed accurately with various coding techniques or values). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teachings of Artieri and Lee, as a whole, for accurately, efficiently encoding/decoding image data while maintaining high image quality and reducing overhead and bandwidth requirements (Lee's col.2, ln.66-col.3, ln.2).

Regarding claim 12, Altieri does not specifically disclose wherein the syntax scheme identifies a differently quantized region to be from among a list of coding possibilities that comprises a single boundary edge, a pair of adjacent boundary edges, and all boundary edges of the frame. However, Lee teaches identifying the differently quantized region to be from among the list of coding possibilities that comprises the single boundary edge and the pair of adjacent boundary edges of the frame, all four boundary edges, and all macroblocks individually (col.28, ln.19-35, Lee discloses that

quantization of image data can be applied to each object for indicating different quantized region from many coding possibilities, in col.37, ln.19-35, Lee discloses the determination of shapes and various boundaries that must include many types of boundaries like single edge of an object, or from object with multiple boundaries as seen in fig.30, and col.37, ln.57-63, Lee discloses that each mask, containing boundary or contour information, can be compressed accurately with various coding techniques or values; col.18, ln.31-35, Lee discloses the object can have plural edges and that the image 204 can four boundary edges (two horizontal and two vertical edges), and that each macroblock in an image can have multiple macroblocks in that each macroblock header are encoded with corresponding macroblock parameters as it's known in MPEG coding). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teachings of Artieri and Lee, as a whole, for accurately, efficiently encoding/decoding image data while maintaining high image quality and reducing overhead and bandwidth requirements (Lee's col.2, ln.66-col.3, ln.2).

Regarding claim 13, Altieri does not specifically disclose wherein the syntax scheme identifies a differently quantized region to be from among a list of coding possibilities that comprises a single boundary edge, a pair of adjacent boundary edges, all boundary edges, and all macroblocks separately. However, Lee teaches identifying the differently quantized region to be from among the list of coding possibilities that comprises the single boundary edge and the pair of adjacent boundary edges of the frame, all four boundary edges, and all macroblocks individually (col.28, ln.19-35, Lee discloses that quantization of image data can be applied to each object for indicating

different quantized region from many coding possibilities, in col.37, ln.19-35, Lee discloses the determination of shapes and various boundaries that must include many types of boundaries like single edge of an object, or from object with multiple boundaries as seen in fig.30, and col.37, ln.57-63, Lee discloses that each mask, containing boundary or contour information, can be compressed accurately with various coding techniques or values; col.18, ln.31-35, Lee discloses the object can have plural edges and that the image 204 can four boundary edges (two horizontal and two vertical edges), and that each macroblock in an image can have multiple macroblocks in that each macroblock header are encoded with corresponding macroblock parameters as it's known in MPEG coding). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teachings of Artieri and Lee, as a whole, for accurately, efficiently encoding/decoding image data while maintaining high image quality and reducing overhead and bandwidth requirements (Lee's col.2, ln.66-col.3, ln.2).

Regarding claim 14, Altieri discloses wherein the syntax scheme includes a frame level quantization strength and a second quantization strength (col.7, ln.1-9, fig.3, element 10, the VLD decoder decodes the headers, via the VLD BUS, of the encoded video data information that contains the quantized information of the image regions applied to macroblock frame data, in that headers must comprise syntactical coding schemes for defining compression parameters to clearly indicate how the content of the video data is encoded, where the quantization parameters or strengths for the encoded image data is included in MPEG compression as seen in fig.12, element 362).

Regarding claim 15, Altieri discloses wherein the second quantization strength is coded relative to the frame level quantization strength (col.7, ln.1-9, fig.3, element 10, the VLD decoder decodes the headers, via the VLD BUS, of the encoded video data information that contains the quantized information of the image regions applied to macroblock frame data, in that headers must comprise syntactical coding schemes for defining compression parameters to clearly indicate how the content of the video data is encoded, where the quantization parameters or strengths for the encoded image data is included in MPEG compression as seen in fig.12, element 362).

Regarding claim 16, Altieri discloses a computer-readable medium having encoded with computer- executable instructions carried thereon for executing on a computer to decode a differential quantization coded video bit stream, the program comprising:

programming instructions for reading differential quantization information signaled in the coded video bit stream according to a syntax scheme (col.7, ln.1-9, fig.3, element 10, the VLD decoder decodes the headers, via the VLD BUS, of the encoded video data information that contains the quantized information of the image regions applied to macroblock frame data, in that headers must comprise syntactical coding schemes for defining compression parameters to clearly indicate how the content of the video data is encoded); and

programming instructions for dequantizing macroblocks of the frame at the different quantization strengths in accordance with the differential quantization information read from the coded video bit stream (col.7, ln.10-27, fig.3, note element 12

is interactively connected by having input data from elements 10, 24 and 28 for controlling a quantization strength applied to the inverse quantizer 12 for decoding and dequantizing macroblock data).

Altieri does not specifically disclose "wherein the syntax scheme represents a different quantization strength of at least a region of macroblocks in a frame of video than other macroblocks of the frame, wherein the syntax scheme codes the region from a choice of a single boundary edge and a pair of adjacent boundary edges of the frame". However, Lee discloses the identifying the differently quantized region to be from among the list of coding possibilities that comprises the single boundary edge and the pair of adjacent boundary edges of the frame (col.28, ln.19-35, Lee discloses that quantization of image data can be applied to each object for indicating different quantized region from many coding possibilities, in col.37, ln.19-35, Lee discloses the determination of shapes and various boundaries that must include many types of boundaries like single edge of an object, or from object with multiple boundaries as seen in fig.30, and col.37, ln.57-63, Lee discloses that each mask, containing boundary or contour information, can be compressed accurately with various coding techniques or values). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teachings of Artieri and Lee, as a whole, for accurately, efficiently encoding/decoding image data while maintaining high image quality and reducing overhead and bandwidth requirements (Lee's col.2, ln.66-col.3, ln.2).

Regarding claim 18, Lee does not specifically disclose wherein the syntax scheme codes the region from a choice of a single boundary edge and a pair of

adjacent boundary edges of the frame. However, However, Lee discloses the identifying the differently quantized region to be from among the list of coding possibilities that comprises the single boundary edge and the pair of adjacent boundary edges of the frame (col.28, ln.19-35, Lee discloses that quantization of image data can be applied to each object for indicating different quantized region from many coding possibilities, in col.37, ln.19-35, Lee discloses the determination of shapes and various boundaries that must include many types of boundaries like single edge of an object, or from object with multiple boundaries as seen in fig.30, and col.37, ln.57-63, Lee discloses that each mask, containing boundary or contour information, can be compressed accurately with various coding techniques or values). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teachings of Artieri and Lee, as a whole, for accurately, efficiently encoding/decoding image data while maintaining high image quality and reducing overhead and bandwidth requirements (Lee's col.2, ln.66-col.3, ln.2).

Regarding claim 20, Altieri does not specifically disclose wherein the syntax scheme codes the region from a choice of a single boundary edge, a pair of adjacent boundary edges, all boundary edges, and all macroblocks separately. However, Lee teaches identifying the differently quantized region to be from among the list of coding possibilities that comprises the single boundary edge and the pair of adjacent boundary edges of the frame, all four boundary edges, and all macroblocks individually (col.28, ln.19-35, Lee discloses that quantization of image data can be applied to each object for indicating different quantized region from many coding possibilities, in col.37, ln.19-35,

Lee discloses the determination of shapes and various boundaries that must include many types of boundaries like single edge of an object, or from object with multiple boundaries as seen in fig.30, and col.37, ln.57-63, Lee discloses that each mask, containing boundary or contour information, can be compressed accurately with various coding techniques or values; col.18, ln.31-35, Lee discloses the object can have plural edges and that the image 204 can four boundary edges (two horizontal and two vertical edges), and that each macroblock in an image can have multiple macroblocks in that each macroblock header are encoded with corresponding macroblock parameters as it's known in MPEG coding). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teachings of Artieri and Lee, as a whole, for accurately, efficiently encoding/decoding image data while maintaining high image quality and reducing overhead and bandwidth requirements (Lee's col.2, ln.66-col.3, ln.2).

Regarding claim 21, Altieri discloses wherein the syntax scheme includes a frame level quantization strength and the different quantization strength (col.7, ln.1-9, fig.3, element 10, the VLD decoder decodes the headers, via the VLD BUS, of the encoded video data information that contains the quantized information of the image regions applied to macroblock frame data, in that headers must comprise syntactical coding schemes for defining compression parameters to clearly indicate how the content of the video data is encoded, where the quantization parameters or strengths for the encoded image data is included in MPEG compression as seen in fig.12, element 362).

Regarding claim 22, Altieri discloses wherein the different quantization strength is coded relative to the frame level quantization strength (col.7, ln.1-9, fig.3, element 10, the VLD decoder decodes the headers, via the VLD BUS, of the encoded video data information that contains the quantized information of the image regions applied to macroblock frame data, in that headers must comprise syntactical coding schemes for defining compression parameters to clearly indicate how the content of the video data is encoded, where the quantization parameters or strengths for the encoded image data is included in MPEG compression as seen in fig.12, element 362).

Regarding claim 23, Altieri discloses a method of decoding a coded video bit stream using differential quantization, comprising:

decoding video content of the coded video bit stream (col.7, ln.1-9, fig.3, element 10);

decoding information from the coded video bit stream which signals differential quantization of the regions in the compressed bit stream using a syntax that includes coding a frame level quantization strength and an alternative quantization strength coded as a difference from the frame level quantization strength (col.7, ln.1-9, fig.3, element 10, the VLD decoder decodes the headers, via the VLD BUS, of the encoded video data information that contains the quantized information of the image regions applied to macroblock frame data, in that headers must comprise syntactical coding schemes for defining compression parameters to clearly indicate how the content of the video data is encoded, where the quantization parameters or strengths for the encoded image data is included in MPEG compression as seen in fig.12, element 362);

dequantizing the macroblocks of the frame according to the signaled different quantization (col.7, ln.10-27, fig.3, note element 12 is interactively connected by having input data from elements 10, 24 and 28 for controlling a quantization strength applied to the inverse quantizer 12 for decoding and dequantizing macroblock data).

Altieri does not specifically disclose the syntax further signaling the regions for differential quantization to be a coding choice out of any of a single boundary edge, a pair of adjacent boundary edges, all four boundary edges, and all macroblocks individually. However, Lee teaches identifying the differently quantized region to be from among the list of coding possibilities that comprises the single boundary edge and the pair of adjacent boundary edges of the frame, all four boundary edges, and all macroblocks individually (col.28, ln.19-35, Lee discloses that quantization of image data can be applied to each object for indicating different quantized region from many coding possibilities, in col.37, ln.19-35, Lee discloses the determination of shapes and various boundaries that must include many types of boundaries like single edge of an object, or from object with multiple boundaries as seen in fig.30, and col.37, ln.57-63, Lee discloses that each mask, containing boundary or contour information, can be compressed accurately with various coding techniques or values; col.18, ln.31-35, Lee discloses the object can have plural edges and that the image 204 can four boundary edges (two horizontal and two vertical edges), and that each macroblock in an image can have multiple macroblocks in that each macroblock header are encoded with corresponding macroblock parameters as it's known in MPEG coding). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teachings of

Artieri and Lee, as a whole, for accurately, efficiently encoding/decoding image data while maintaining high image quality and reducing overhead and bandwidth requirements (Lee's col.2, ln.66-col.3, ln.2).

3. Claims 9, 10 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Altieri (6,104,751) and Lee (5,748,789) in view of Jacquin (5,764,803).

Regarding claims 9, 10 and 17, Artieri and Lee do not specifically disclose the syntax scheme includes region identification coding for a variety of regions classifiable as less perceptually significant due to panning or zooming. However, Jacquin teaches determining whether global motion estimation of the video at the frame in the video sequence is characteristic of panning or zooming (col.3, ln.61-66 and col.4, ln.40-42, the zoom and pan data are characteristics that are included in global motion parameters that are analyzed and considered during the analysis of motion vector data from macroblocks, and col.5, ln.1-4, wherein global motion parameters are updated and refined). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teachings of Artieri, Lee and Jacquin, as a whole, for accurately, efficiently encoding/decoding image data while maintaining high image quality and reducing bandwidth requirements (Jacquin's col.2, ln.43-47).

Allowable Subject Matter

Claims 1-7 are allowed.

The following is a statement of reasons for the indication of allowable subject matter: The prior art does not specifically disclose the combination of limitations of claim 1: a method of differential quantization in video coding of a coded video bit stream,

comprising: analyzing motion vectors of macroblocks for a frame of a video sequence to determine whether global motion of the video at the frame in the video sequence is characteristic of panning or zooming; classifying regions of the frame according to perceptual significance based on the global motion determination; differentially quantizing the regions according to their perceptual significance classification in coding a compressed bit stream of the video sequence; signaling different quantization of the regions in the compressed bit stream, wherein the signaled different quantization includes signaling different quantization strength for macroblocks in a region on at least one boundary edge of the frame, and wherein the signaling uses a syntax that includes coding a choice of the region from among the boundary edges of the frame; reading the signaled different quantization from the compressed bit stream; and dequantizing the macroblocks of the frame according to the signaled different quantization.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Allen Wong whose telephone number is (571) 272-7341. The examiner can normally be reached on Mondays to Thursdays from 8am-6pm Flextime.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John W. Miller can be reached on (571) 272-7353. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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